Sectoral growth and income inequality in ASEAN-5 countries: case of low-middle income economies

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SECTORAL GROWTH AND INCOME INEQUALITY IN ASEAN-5 COUNTRIES: CASE OF LOW-MIDDLE INCOME ECONOMIES

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ABSTRACT

This paper aims to explore the relationship between growth in economic sectors, especially manufacturing, service, and agriculture, towards income inequality. Furthermore, it utilizes panel data for low-middle income ASEAN countries. The result shows that the share of agricultural sector in GDP has a significant and negative relationship with income inequality. In fact, the effect is robust for the incorporation of control variables. Therefore, it underlines the importance of agricultural sector development for reducing inequality and also for fostering ASEAN economic integration.

Keywords: *ASEAN, Developing Countries, Economic Development*

INTRODUCTION

Low-middle income ASEAN countries (Indonesia, Myanmar, Vietnam, Lao PDR, and Philippines) have challenges during their economic growth process. As shown in Figure 1.1, on average, when the growth increases, the trend in income inequality follows (see Figure 1.1). In fact, between 2005 and 2017, several low-middle income countries such as Indonesia, Vietnam, and Lao recorded an increase in Gini ratio (ASEAN, 2019). This situation has the possibility to decrease the quality of economic growth.

In general, in addition to poverty and unemployment, inequality is an important indicator of economic development (Seers, 1969). Interestingly, this phenomenon is not always seen as negative, because it can be an incentive for working harder and taking more risks by generating innovation. According to Forbes (2000), for a short period of time, a degree of income inequality is good for economic growth (Forbes, 2000). However, when the trend keeps

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increasing for a long period of time, then it jeopardizes the growth process and generates instability in the society (Alesina and Rodrik, 1994; Perrson and Tabellini, 1994; Barron, Jaffrey, and Varshney 2004).

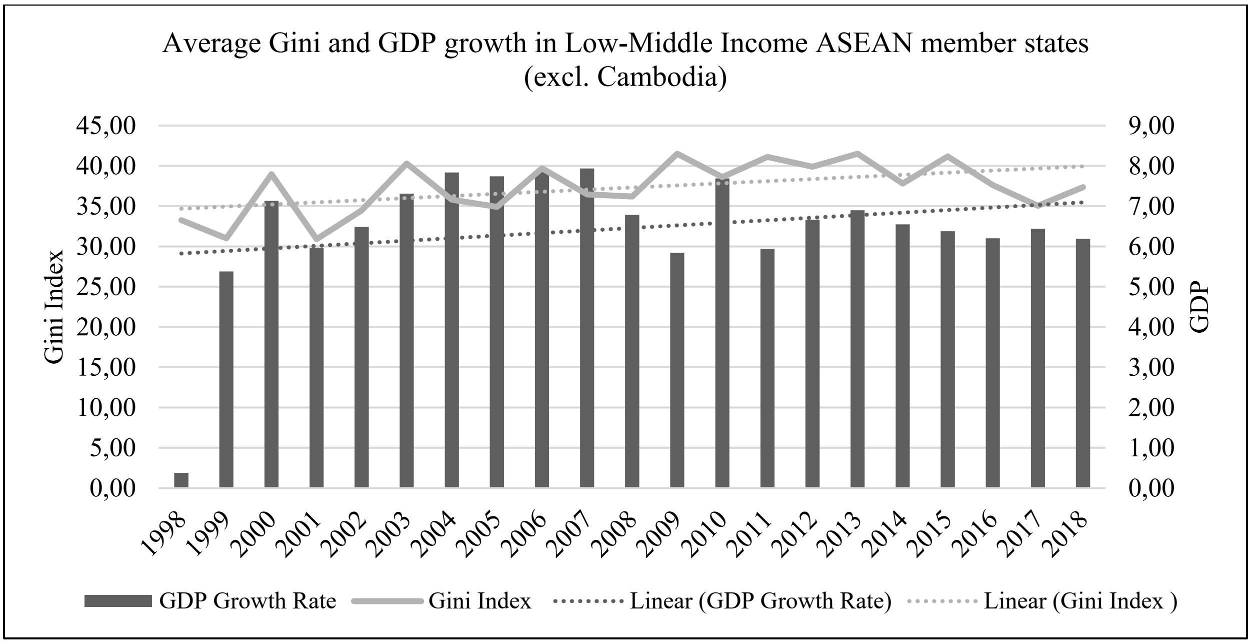

Figure 1 Average Gini and GDP Growth in Low-Middle Income ASEAN Member States (excl. Cambodia)

Source: World Development Indicators, The World Bank (Author's calculation)

Furthermore, as expressed by Paus (2017), income inequality and economic productivity are important affairs to be addressed by low-middle income countries to avoid the Middle Income Trap (MIT). In fact, this phenomenon can damage productivity and innovation through a number of channels, such as unequal education, which can damage human capital accumulation process, and results in low productivity and decreased economic growth (Paus, 2017). Therefore, lack of education and health services combined with deficiency in redistributive policies, such as conditional cash transfer and tax reform have become major factors for increasing income inequality in emerging and low-middle income economies (Brueckner, Dabla-Norris, and Gradstein, 2014; Dabla-Norris, Kochhar, Suphaphiphat, Ricka, Tsounta, 2015; Fournier and Johansson, 2016; Pratysto and Panjaitan, 2019).

However, the ASEAN economy remains in a favourable condition, as the Gross Domestic Product (GDP) experienced a positive trend from 2000 to 2018, which placed the ASEAN group as the fifth largest economy in the world with US$3,0 trillion. When the GDP is decomposed by economic sector, during the period of 2005-2018, the service sector experienced a decent growth, with an increase from 46,6% in 2005 to 50,9% in 2018. Therefore, the service sector was the leading in almost all ASEAN countries. However, agriculture remains a major field in the member states, which are classified as low-middle income countries, such as Myanmar (24,6%), Cambodia (16,3%), Lao PDR (14,5%), Vietnam (14,3%), Indonesia (12,5%), and the Philippines (8,1%) (ASEAN Secretariat, 2019).

By conducting panel data analysis from the member states that are grouped as low-middle income countries, this study examines the relationship between income inequality. This was measured by the Gini Index and three economic sectors, namely manufacturing, service, and agriculture, which are indicated by their share of GDP. The results show that the agricultural sector has a significant and negative relationship with income inequality. In fact, the results are robust when the control variables are included. Hence, it indicated that agriculture has been more inclusive compared to two others, which are manufacturing and services. Therefore, it is important for the policy makers in these countries to focus on transforming the development of their agriculture, in order to generate inclusive growth. However, the study does not include Cambodia due to a severe lack of data.

The rest of the paper proceeds as follows. Section 2 presents the literature analysis, which consists of studies development on economic growth and inequality. Section 3 provides the econometrics method used for this study, while the result analysis is presented in Section 4. Lastly, the paper ends with the conclusion and policy implications in Section 5.

LITERATURE REVIEW

In general, studies on the topic of income inequality have attracted great attention from policy makers and social scientists, especially in the political economy. For example, Alesina and Rodrik (1994) studied the relationship between politics and economic growth. The basic message from their study is that inequality in income and land distribution hinders economic growth. Therefore, a redistributive policy is necessary (Alesina and Rodrik, 1994). However, Barro (2000) found that this phenomenon has a small effect on its relationship with economic growth (Barro, 2000). Furthermore, according to Forbes (2000), income inequality has a positive relationship with economic growth. Lopez (2003) argued that macroeconomic indicators such as financial development, small-sized governments, and trade openness corresponded to increasing inequality levels. In addition, in the globalization context, several researches found a link between income inequality and foreign investment activities (Feenstra and Hanson, 2003; Furceri and Loungani, 2015).

Also, several researches devoted attention to the nexus between technology and inequality. Ding et al. (2011) studied the impact of technology adoption in the agricultural sector, and found an increase of up to 15% in the income among farmers who adopted it. However, the impact on local income inequality is still low (Ding, Meriluoto, Reed, Tao, and Wu, 2011). Asongu et al. (2019) also contributed the analysis between inequality and technology using the education variable. Their study showed that this phenomenon hinders access to technology utilization, and concluded that several thresholds in its measurements such as the Gini and Atkinson Index should not be exceeded. This is important in order to maintain access to the internet and fixed broadband subscriptions. Such access to ICT is important in supporting the inclusive education of 42 countries in sub-Saharan Africa (Asongu, Orim, and Nting, 2019).

In addition, institution or government capacities also play an important role in shaping inequality, especially in developing countries as expressed by the UNESCAP (2018), Chong and Gradstein (2004). In the context of ASEAN countries, Xu and Islam (2019) stated the importance of increasing institutions' capacity to tackle the inequality that exists within and across age cohorts among workers in Thailand, which emerged within the economic community. Moreover, institutions can exhibit such capacities through the form of social expenditures, such as education and health, as studied by Fournier and Johansson (2016). The study showed that social spending such as family benefits and subsidies can decrease inequality. Furthermore, it was suggested that the government needs to encourage the completion of secondary education as it helps decrease inequality (Fournier and Johansson, 2016).

These studies suggested a relationship between inequality and other aspects such as government, technology, and globalization. However, there are limited empirical research on the relationship between inequality and the economic sector, especially in low-middle income countries in the ASEAN region.

Growth in different economic sectors especially amongst ASEAN states is interesting to be studied. As mentioned previously, the agricultural sector plays a significant role among the members, which are classified as low-middle income countries. Meanwhile, the sector not only plays an important role as an output supplier but also influences food security affairs (OECD & FAO, 2017). Moreover, this sector remains the largest employer in a number of Asian countries, in which Vietnam, Thailand, and Myanmar are included as ASEAN members (Briones and Felipe, 2013). However, Industrial and service sectors are becoming a key engine for economic growth. In fact, for ASEAN countries, the expansion of the service sector has transformed it into a principal provider in terms of economic output and employment. This condition may affect the income elasticity of demand within the economy (Namini, 2017; Aldaba and Pasadila, 2010). Therefore, it raises a primary question: how do the economic sectors affect inequality in income, especially in low-middle income countries in the ASEAN region?

Recently, Namini and Hudson (2018) studied the impact of growth in different economic sectors and monetary policy on income inequality in developing countries. Their study concluded that the agricultural and industrial sectors have a significant and negative relationship with income inequality, whereas the growth of service sector has a positive effect. Furthermore, they confirmed the existence of Kuznet's inverted "U" in the industrial and service sectors (Namini and Hudson, 2018). This result resonates with other studies such as Imai (2016), who concluded that agricultural growth helps to lower income inequality both directly and indirectly in developing middle-income countries. Meanwhile, country-specific studies such as Gordón and Resosudarmo (2018) concluded that the agricultural sector is inclusive in Indonesia, as the share in GDP has a negative and significant relationship with inequality. Whereas both the manufacturing and service shares of GDP have positive and significant effects. In fact, the effects are robust when the control variables are included. The study utilized panel data from 431 districts and cities in Indonesia during the period of 2000-2010 (Gordón and Resosudarmo, 2018). In other countries like Vietnam, agricultural activities play an important role in alleviating poverty and reducing inequality, especially in rural areas (Cuong, 2010).

This study aims to contribute to the current literature by exploring the relationship between three different economic sectors and income inequality, exclusively in low-middle income countries within the ASEAN region. Furthermore, this study incorporates other types of data from government spending as control variables that influence income inequality.

RESEARCH METHODS

This study uses data from ASEAN member states that belong to the group of low-middle income countries based on the World Bank classification. These countries are Indonesia, Myanmar, Vietnam, Lao PDR, and the Philippines. Despite the fact that Cambodia also belongs to this group, the country is not included in the analysis due to the lack of data in the Gini Index variable.

The data were accessed from the World Bank data portal, World Development Indicator, from 1998 to 2018, in which information collected on the Gini Index was used as a measurement, as well as a dependent variable. Moreover, being a popular measurement, the Index provides a convenient summary on degree of inequality measurement and simple illustration on the changes in equity at a given period over time (Haughton and Khandker, 2009; Farris, 2010). Furthermore, it satisfies one of the standards in inequality measurement which is ‘Transfer Principle’ (Trapeznikova, 2019). This criterion is important when it comes to comparison in income distribution across countries.

For the independent variables, this study uses economic sector contribution data on agriculture, forestry, and fishing value added (% of GDP); manufacturing value added (% of GDP); and services value added (% of GDP). The reasons for choosing these sectors are due to data availability and has been used frequently, as well as because the activity within the economic composition may affect income inequality level (Montalvo and Ravallion, 2010). Moreover, understanding the composition of economic sectors would be beneficial for policy maker to identify the potential fields to be developed (Riantika and Utama, 2017).

In addition, data for the control variables are based on total government expenditure on education (% of GDP), domestic health (% of GDP), final consumption (% of GDP), and total employment to population ratio 15+ (%) (Modelled ILO estimate).

Based on the condition of the data, this study conducts the unbalanced panel data analysis. Through this analysis, it manages to control individual heterogeneity and generates more reliable estimates from the dataset compared to other econometrics methods, such as time series and cross-section analysis (Gujarati and Porter, 2009).

In most cases, the panel data model is grouped into three categories, which are pooled OLS, fixed effect, and random effect model. Meanwhile, the pooled data has persistent coefficient for both intercepts and slopes. It usually pools all of the data and runs an ordinary least square model (OLS). This model can be specified as follows:

$$GINI_{it} = \beta_0 + \beta_1 MANU_{it} + \beta_2 SERV_{it} + \beta_3 AGRIF_{it} + dX_{it} + u_{it} \quad (1)$$

Where $GINI_{it}$ = Gini Index, $MANU_{it}$ = share of manufacturing sector in GDP, $SERV_{it}$= share of services sector in GDP, and $AGRIF_{it}$ = share of agriculture, forestry, and fishing sector in GDP, X_{it} = control variables. Following Fournier and Johansson (2016) and Anderson et al. (2018), this study incorporated the government variables as a control because it is associated with inequality. In addition, other control variables such as employment-to-population ratio that measure condition of the labour market are also included in the analysis (Gordón and Resosudarmo, 2018).

Furthermore, because the pooled OLS model cannot control the unobserved individual effects since the heterogeneity of the countries is under consideration, it might affect the measurement of the estimated parameters. Therefore, in order to control for individual heterogeneity, this study used random effects model in which the difference across countries can be recorded within the model. By incorporating countries' individual effects, the random model can be constructed from equation (2) as follows:

$$GINI_{it} = \beta_0 + \beta_1 MANU_{it} + \beta_2 SERV_{it} + \beta_3 AGRIF_{it} + dX_{it} + v_{it} \quad (2)$$

Where v_{it} is a component of the random error term, which consists of between-country error (ω_{it}) and within-country error (ε_{it}) over time. Meanwhile, the random-effects model explains that a country's error does not correlate with the explanatory variables. However, when a country's error is correlated with the explanatory variables, then the study should use the fixed effect model to allow each country to have its own intercept. The fixed-effects model is specified as follows:

$$GINI_{it} = \beta_0 + \beta_1 MANU_{it} + \beta_2 SERV_{it} + \beta_3 AGRIF_{it} + dX_{it} + u_{it} \quad (3)$$

The Hausman Test was conducted to test for the possible existence of a correlation between a country's error and its explanatory variables. Meanwhile, the null hypothesis for this test is that there is no correlation between individual countries' error with its explanatory variable (i.e., random effect). When the hypothesis is being rejected, then it means the fixed-effects model is preferred. However, when the hypothesis is being accepted, then it prefers the random-effects model. This study also conducted the Breusch-Pagan LM test in order to choose the best between the random-effects and the OLS model. By doing this, the study utilized a single error component model i.e., either fixed-effects, random-effects, or OLS model.

ANALYSIS

Based on the panel regression, the study found that the F and Wald Test are significant at the 1% level for both models. This means the independent variables in both models can explain the behaviour of the dependent variable (i.e., they do not reject the null hypothesis). Moreover, based on the results from the Hausman Test, the fixed-effects model is statistically preferred over the random-effects model. Furthermore, from the fixed-effects model, the study found that the services sector (SERV) provided positive coefficient on income inequality, while manufacturing (MANU) and agriculture, forestry, and fishing (AGRIF) have negative coefficient. However, only the last variable gives significant relationship with p-value equals to 0,03 or 5% level (see Appendix, Table A1).

Also, when the model is added by other control variables, there are changes that emerge. Firstly, based on the Hausman and Breusch-Pagan LM test, the OLS model becomes the preferred choice. Secondly, the robust option is added during the OLS model with the aim to control heteroskedasticity. Therefore, it showed where the three appointed sectors in the economy have negative coefficients towards income inequality. However, only agriculture, forestry, and fishing (AGRIF) that have significant level and p-value of 0,006 (1% level), showed greater significance than the previous model where the control variables were not included. Moreover, the coefficient from the agricultural sector to income inequality remains the same at 0,096. In other words, a 1% increase in the agriculture share of GDP lowers inequality as measured by Gini Index up to 0,096 points (see Appendix, Table A2).

As the finding emphasized the significance of the agricultural sector on inequality, there are both empirical and theoretical elements found in the literature that support this finding. Therefore, the result of this study resonates with others such as Namini and Hudson (2018) who found that the agriculture sector has a greater impact compared to manufacturing in reducing income inequality in developing countries. Furthermore, other ASEAN country-specific studies such as by Gordón and Resosudarmo (2018) and Cuong (2010) concluded that the agricultural sector in Indonesia and Vietnam are associated with decreasing income inequality level within the country. Finally, this result not only indicated that the agricultural sector is more inclusive than others but also supports the idea from Menon (2012) regarding the importance of policy making in contributing to productivity in order to reduce inequality (Menon, 2012).

CONCLUSION

This study aims to explore the relationship between three economic sectors, namely manufacturing, services, and agriculture. Furthermore, it employs an annual panel data analysis ranging from 1998-2018 in ASEAN member countries classified as low-middle income countries.

In the first step, the study applied the Hausman test, whose results showed the fixed-effects model is preferred. Also, it showed that the agricultural sector is significant at 5% level.

Furthermore, control variables were incorporated in the next analysis in which the OLS model has been appointed with the robust option being added. The result showed an increase in significance in the agricultural sector on income inequality at 5% to 1% levels, with a coefficient that remains the same at 0,096.

Based on the results, it was concluded that the agricultural sector has been more inclusive than others, including manufacturing and services. Therefore, it is suggested that this sector can be enhanced and become the focus of development agenda for the sample countries. Furthermore, there are several policy implications drawn from this result. Firstly, because an increase in agricultural share of GDP is significant for reducing income inequality, land reforms and improvements are necessary to increase productivity and opportunities for people to participate in this growth creation, especially in rural areas (World Bank, 2003; Menon, 2012). In addition, enhancing the sector is beneficial not only for reducing inequality and creating better growth, but also for the integration process in ASEAN countries. The agricultural, forestry, and fishing sectors are among the most important components for ASEAN countries' single market and production, and they therefore foster the development of the ASEAN Economic Community project (AEC). They also improve the economic integration within the countries (Pangestu, 2009).

LIMITATIONS & FURTHER RESEARCH

The limitation of this study is exclusively on income as inequality dimension and Gini Index for the measurement. This is subject to imperfections as economies with equivalent Gini Index may have dissimilar income distribution. In other words, the Index does not explain what happens in the opposite tails, as it puts higher weight in the middle of the distribution. In context of inclusive growth policies, when one would like to understand what happens on the poorer one, it is suggested to use the Palma ratio instead of the Gini Index for the measurement, and use consumption data as focal point (Trapeznikova, 2019).

Moreover, using inequality in opportunities as other dimension for dependent variable is worth to be utilized for further research, for example, unequal access in education which may lead to human capital inequality is beneficial (Castelló and Doménech, 2002).

In addition, it is beyond the scope of the study to analyse the relationship between sub-sectors from the three main economic sectors on income inequality. As the study's result suggested the enhancement of agricultural, forestry, and fishing sector, it is important to note that the statistics may include commodities (sub-sectors) such as palm oil, which generates both positive and negative effect in terms of environmental and socio-economic aspects (Kubitza et al., 2019). Therefore, it should become a consideration in the policy making process.

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APPENDIX

Table A1

Panel data Models: Dependent variable (GINI)		
Independent Variables	Fixed Effect	Random Effect
MANU	-0,013 *(-0,33)*	-0,003 *(-0,09)*
SERV	0,063 *(1,01)*	-0,016 *(-0,43)*
AGRIF	-0,096* *(-2,19)*	-0,184*** *(-5,01)*
Constant	11,270* *(2,49)**	12,489*** *(6,15)*
Model Summary		
R^2	0,1643	0,2190
F-Test	4,03**	
Prob > F	0,004	
Wald Test		28,32***
Prob > chi2		0,000
Hausman Test		20,54***
Countries Included	5	5
Total Panel Observations	105	105

Note: Significance level ***p<0,001, **p<0,01, and *p<0,05. The null hypothesis of the Hausman Test is that there is no correlation between individual countries' error with its explanatory variable. Values in parentheses are the *t*-value.

Table A2

Panel Data Models: Dependent variable (GINI)	
Independent Variables	OLS
MANU	-0,004 *(-0,20)*
SERV	-0,029 *(-0,97)*
AGRIF	-0,096** *(-2,82)*
GOVEDUC	0,148 *(1,82)*

GOVCONS	*0,069* *(1,29)*
GOVHEAL	0,056 *(1,30)*
EMPOPTOT	-0,296* (-2,61)
Constant	29,048*** *(3,60)****
Model Summary	
R^2	0,331
F-Test	8,92***
Prob > F	0,0000
Hausman Test	9,66
Breusch-Pagan LM	0,00
(Prob > chibar2)	(1,0000)
Countries Included	5
Total Panel Observations	105

Note: Significance level ***p<0,001, **p<0,01, and *p<0,05. The null hypothesis of the Hausman Test is that there is no correlation between individual countries' error with its explanatory variable. The null hypothesis of the Breusch-Pagan LM test is that variances across entities is zero. Values in parentheses are the *t*-value.